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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/591,238	05/14/2007	Laurent Bazinet	6013-146US	9269

20988 7590 04/12/2011

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EXAMINER	
RAPHAEL, COLLEEN M	
ART UNIT	PAPER NUMBER
1724	

MAIL DATE	DELIVERY MODE
04/12/2011	PAPER

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/591,238	BAZINET ET AL.	
	Examiner	Art Unit	
	COLLEEN M. RAPHAEL	1724	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-25* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-25* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *31 August 2006* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date *02/08/2007*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Status of Claims

1. Claims 1-25 are current in the application. Claims 1-25 are currently under examination.

Information Disclosure Statement

2. The information disclosure statement (IDS) submitted on February 8, 2007 was filed after the mailing date of the application on August 31, 2006. The submission is in compliance with the provisions of 37 CFR 1.97. Accordingly, the information disclosure statement is being considered by the examiner.

Claim Objections

3. Claims 24 and 25 are objected to because of the following informalities: All amended claims should be clearly marked as such. See MPEP 714 and 37 CFR 1.121(c). In the claim listing, the status of every claim must be indicated after its claim number by using one of the following identifiers in a parenthetical expression: (Original), (Currently amended), (Canceled), (Withdrawn), (Previously presented), (New), and (Not entered). Appropriate correction is required.

4. The Examiner notes that there appear to be two separate listings of amended claims submitted on August 31, 2006. It is therefore unclear from the record exactly which set of claims is the controlling set of claims to be considered for examination purposes. For the purposes of compact prosecution, the Examiner will examine the set of amended claims that is more closely in compliance with U.S. practice (i.e. the set with the status of each claim indicated after the claim number).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6. The factual inquiries set forth in *Graham* v. *John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-2, 4-5, 8-10, 13-15, 117, 20 and 22-23 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain (US 4,322,275) in view of Tye (US 3,046,211).

Regarding claim 1, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate

through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Jain by operating the cell with no pressure differential between the cell compartments as taught by Tye, because this would optimize the flow rate through the membranes from the concentrating liquid to the desalting liquid. (see Tye, col. 3, lines 33-36).

Regarding claim 2, Jain teaches that the said electrodialysis cell comprises, at least one cationic membrane, at least one filtration membrane, and at least one anionic membrane on the side of the filtration membrane opposed to the side of the cationic membrane. (Fig. 6, parts N and C, col. 12, lines 15-21)

Regarding claim 4, Jain teaches that the process can be a batch recirculation process. (col. 10, lines 35-38)

Regarding claim 5, Jain teaches that said neutral or charged organic compounds are separated simultaneously during performing the process. (col. 3, lines 51-58)

Regarding claim 8, Jain teaches that said filtration membrane is a charged or neutral membrane. (col. 8, lines 20-25)

Regarding claim 9, Jain teaches that the pH of the feed solution may be between 2 to 11.5 (col. 8, lines 1-15).

Regarding claim 10, Jain teaches that the compounds are of animal or vegetable origin. (col. 2, lines 42-45)

Regarding claim 13, Jain teaches that the feed solution may comprise blood plasma (which the Examiner is construing as comprising neutral organic compounds). (col. 2, lines 10-13)

Regarding claim 14, Jain teaches that the passing of step a) may be performed by continuous recirculation of the feed solution through the electrodialysis cell. (col. 7, lines 39-41)

Regarding claim 15, Jain teaches that said permeate is an aqueous solution or a salted solution thereof. (col. 6, lines 31-33 and col. 7, lines 59-60).

Regarding claim 16, Tye teaches that said permeate comprises salts at a concentration between 0.01 to 10 g/L (where the Examiner is construing the mass concentration of salt as equivalent to g/L). (col. 4, lines 44-54)

Regarding claim 17, Jain teaches that said feed solution may comprise acid compounds having pH of below 5.0, neutral compounds having pH between 5.0 to 8.0, and basic compounds having pH over 8.0 (where the Examiner is construing the blood plasma as comprising acid, neutral, and basic compounds). (col. 6, lines 10-13)

Regarding claim 20, Jain teaches that said electrodialysis cell comprises at least one cationic membrane, at least one filtration membrane and at least one anionic membrane, each membrane being separately compartmented. (Fig. 6, col. 12, lines 18-22)

Regarding claims 22 and 23, Jain teaches that the electrical field may be pulsed (alternating current) and that the electrical field may comprise pulse periods of inverted electrical field. (Fig. 6, col. 12, lines 16-18)

9. Claims 3, 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain (US 4,322,275) in view of Tye (US 3,046,211) as applied to claim 1 above, and further in view of Akashe et al (US Pat. Pub. 2002/0102339 A1)

Regarding claim 3, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Jain nor Tye teaches that the pH of the feed solution is adjusted to preserve the charges of said compounds.

Akashe et al teaches adjusting the pH of said feed solution to preserve the charges of said compounds (where the Examiner is construing the solubilization of proteins and the release of flavoring compounds as preservation of charges). (para. 0038, lines 1-15) Akashe et al teaches that this allows release and separation of the desired compounds (e.g. flavoring compounds into permeate and retention of protein content). (para. 0007, lines 1-8)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the process of Jain and Tye by adjusting the pH of the feed solution to preserve the charges of the said compounds, because this would allow release and separation of the desired compounds. (see Akashe, para. 0007, lines 1-8)

Regarding claim 6, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution (see Jain, col. 6, lines 10-17) , and Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (see Tye, col. 3, lines 33-45)

Neither Jain nor Tye explicitly teach that the filtration membrane may be a cellulose ester ultrafiltration membrane.

Akashe teaches that the filtration membrane may be a cellulose ester ultrafiltration membrane. (para. 0029, lines 1-10) Akashe teaches that this allows formation of the membrane into different shapes (e.g. hollow tubes, flat sheets, or spiral designs). (para. 0029, lines 11-14)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the process of Jain and Tye by using a cellulose ester filtration membrane as taught by Akashe, because this would allow formation of the membrane into different shapes (e.g. hollow tubes, flat sheets, or spiral designs). (see Akashe, para. 0029, lines 11-14)

Regarding claim 7, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution (see Jain, col. 6, lines 10-17) , and Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (see Tye, col. 3, lines 33-45)

Neither Jain nor Tye explicitly teach that said filtration membrane has a molecular weight cut off selected in the range between 0.1 to 50,000 kDa.

Akashe et al teaches a filtration membrane with a molecular weight cutoff up to about 50,000 Daltons. (para. 0030, lines 8-12). Akashe et al teaches that this allows retention of proteins and passage of smaller compounds (para. 0030, lines 5-9)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the process of Jain and Tye by using a filtration

membrane with a molecular weight cutoff up to about 50,000 Daltons as taught by Akashe et al, because this would allow retention of proteins and passage of smaller compounds (see Akashe, para. 0030, lines 5-9).

10. Claims 11 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain (US 4,322,275) in view of Tye (US 3,046,211) as applied to claim 1 above, and further in view of Canivenc et al (US 6,312,578 B1).

Regarding claim 11, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution

during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Jain nor Tye explicitly teach that said compounds are physically, chemically or enzymatically hydrolyzed before performing step a).

Canivenc et al teaches hydrolyzing the compounds before performing electrodialysis. (col. 4, lines 1-5). Canivenc et al teaches that the hydrolysis step improves the depolymerization yield and converts the oligomers into monomers. (col. 3, lines 1-4).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Jain and Tye by first performing a hydrolysis of the compounds as taught by Canivenc et al, because this would improve the depolymerization yield and convert the oligomers into monomers. (see Canivenc et al, col. 3, lines 1-4).

Regarding claim 12, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and

charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Jain nor Tye explicitly teach that said composition flows through said electrodialysis cell at a rate of between 0.1 to 10 L/min, and said permeate at a rate of 0.1 to 150 L/min.

Canivenc et al teaches that said composition flows through said electrodialysis cell at a rate of between 0.1 to 10 L/min, and said permeate at a rate of 0.1 to 150 L/min. (col. 9, lines 14-16 and 30-32) Canivenc et al teaches that this produces a faradic yield of between 75 and 77%. (col. 9, line 45).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the process of Jain and Tye by using the composition and permeate flow rates taught by Canivenc et al, because this would produce a faradic yield of between 75 and 77%. (see Canivenc et al, col. 9, line 45).

11. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jain (US 4,322,275) in view of Tye (US 3,046,211) as applied to claim 1 above, and further in view of Yamada et al (US 2006/0065279 A1).

Regarding claims 18 and 19, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one

filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Jain nor Tye explicitly teaches that at least two filtration membranes are used to allow targeted molecular weight separation of said compounds in combination with charge separation.

Yamada et al teaches that at least two filtration membranes are used to allow targeted molecular weight separation of said compounds in combination with charge separation, and that each filtration membrane may have a molecular weight cut-off

different from the other or others. (para. 0028, lines 7-11) Yamada et al teaches that this allows mixtures of the non-permeate fraction and/or the membrane permeate fraction to adjust taste or flavor of the prepared flavoring agent. (para. 0027, lines 1-6)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the process of Jain and Tye by using multiple filtration membranes to target molecular weight separation of the compounds, because this would allow mixtures of the non-permeate fraction and/or the membrane permeate fraction to adjust taste or flavor of the prepared flavoring agent. (see Yamada, para. 0027, lines 1-6)

12. Claim 21 is rejected under 35 U.S.C. 103(a) as being unpatentable over Jain (US 4,322,275) in view of Tye (US 3,046,211) as applied to claim 1 above, and further in view of Liang et al (US 6,649,037 B2).

Regarding claim 21, Jain teaches a process for separation or concentration of organic of at least one of neutral or charged compounds in a feed solution, said process comprising the steps of: a) passing at least once a feed solution containing neutral and charged organic compounds (where the Examiner is construing blood plasma or other protein mixtures as containing neutral and charged organic compounds) (col. 6, lines 10-17) through an electrodialysis cell under electrical field, said electrodialysis cell comprising at least one charged membrane, and at least one filtration membrane (where the Examiner is construing the neutral membrane as comprising a filtration membrane) (col. 6, lines 22-32), and b) collecting separated fractions of permeate after passage of said neutral or charged compounds through said filtration membrane, each

separated fraction containing separately neutral or charged compounds (col. 6, lines 44-55), wherein an ionic solution circulates between said charged membrane and said filtration membrane on the side of the filtration membrane opposed to the side on which circulates the charged compounds containing feed solution (col. 6, lines 31-33), the charged compounds passing through said filtration membrane in the ionic solution during passage in the electrodialysis cell, and neutral compounds remaining in the feed solution. (col. 6, lines 44-49)

Jain does not explicitly teach that said cell is operated with no pressure differential between the cell compartments.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Jain nor Tye teach that the pH in a compartment is different from pH of other compartments.

Liang et al teaches that the pH in an electrodialysis cell compartment may be different from the pH of other compartments (where the Examiner is construing the electrodeionization device and method of Liang et al as equivalent to an electrodialysis device and method). (col. 8, lines 29-41). Liang et al teaches that this may keep precipitating compounds in solution in the concentrating compartment. (col. 8, lines 39-42)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the method of Jain and Tye by having the pH in an electrodialysis cell compartment differ from the pH of other compartments as taught by Liang et al, because this would keep precipitating compounds in solution in the concentrating compartment. (see Liang et al, col. 8, lines 39-42)

13. Claim 24 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahlgren (US 4,123,342) in view of Tye (US 3,046,211).

Regarding claim 24, Ahlgren teaches a system for separation or concentration of organic charged compounds in a feed solution, said system comprising an electrodialysis cell comprising spaced-apart positive and negative electrodes (Fig. 1, parts 38 and 40, col. 2, lines 25-33), and at least one charged membrane and at least one filtration membrane (Fig. 1, parts 31 and 30, col. 2, lines 25-29), the electrodialysis cell having a first compartment defined between the at least one charged membrane and the at least one filtration membrane for receiving a flow of ionic solution (Fig. 1, part 33b, col. 3, lines 38-63), and a second compartment provided on a side of the at least one filtration membrane opposite to said at least one charged membrane for receiving a flow of feed solution (Fig. 1, part 33a, col. 3, lines 38-46), the charged compounds contained in the feed solution passing under electric forces through said at least one filtration membrane into the ionic solution, the neutral compounds contained in the feed solution remaining in the feed solution. (Fig. 1, parts 31, 32, 33a, 33c, col. 4, lines 37-47).

Ahlgren does not explicitly teach that the charged compounds pass under electric forces with no pressure through the filtration membrane.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the system of Ahlgren by operating the electrodialysis cell with no pressure differential between the cell compartments as taught by Tye, because this would optimize the flow rate through the membranes from the concentrating liquid to the desalting liquid. (see Tye, col. 3, lines 33-36).

14. Claim 25 is rejected under 35 U.S.C. 103(a) as being unpatentable over Ahlgren (US 4,123,342) in view of Tye (US 3,046,211) as applied to claim 24 above, and further in view of Jangbarwala (US Pat. Pub. 2003/0213748 A1).

Regarding claim 25, Ahlgren teaches a system for separation or concentration of organic charged compounds in a feed solution, said system comprising an electrodialysis cell comprising spaced-apart positive and negative electrodes (Fig. 1, parts 38 and 40, col. 2, lines 25-33), and at least one charged membrane and at least one filtration membrane (Fig. 1, parts 31 and 30, col. 2, lines 25-29), the electrodialysis cell having a first compartment defined between the at least one charged membrane and the at least one filtration membrane for receiving a flow of ionic solution (Fig. 1, part 33b, col. 3, lines 38-63), and a second compartment provided on a side of the at least

one filtration membrane opposite to said at least one charged membrane for receiving a flow of feed solution (Fig. 1, part 33a, col. 3, lines 38-46), the charged compounds contained in the feed solution passing under electric forces through said at least one filtration membrane into the ionic solution, the neutral compounds contained in the feed solution remaining in the feed solution. (Fig. 1, parts 31, 32, 33a, 33c, col. 4, lines 37-47).

Ahlgren does not explicitly teach that the charged compounds pass under electric forces with no pressure through the filtration membrane.

Tye teaches an electrodialysis cell operated with no pressure differential between the cell compartments. (col. 3, lines 33-45) Tye teaches that this optimizes the flow rate through the membranes from the concentrating liquid to the desalting liquid. (col. 3, lines 33-36).

Neither Ahlgren nor Tye explicitly teaches that said electrodialysis cell comprises at least one cationic membrane, at least one filtration membrane, and at least one anionic membrane on the side of the filtration membrane opposed to the side of the cationic membrane.

Jangbarwala teaches an electrodialysis cell comprising at least one cationic membrane, at least one filtration membrane, and at least one anionic membrane on the side of the filtration membrane opposed to the side of the cationic membrane (where the Examiner is construing the anionic-permeable membrane as an anionic-selective membrane). (Fig. 8, parts 118, 120, 181, para. 0047, lines 1-8 and para. 0048, lines 1-

10) Jangbarwala teaches that this allows collection of the retentate and the cations and anions. (para. 0011, lines 20-21)

Therefore, it would have been obvious to one with ordinary skill, in the art at the time of the invention, to modify the system of Ahlgren and Tye by including at least one cationic membrane, at least one filtration membrane, and at least one anionic membrane on the side of the filtration membrane opposed to the side of the cationic membrane as taught by Jangbarwala, because this would allow collection of the retentate and the cations and anions. (see Jangbarwala, para. 0011, lines 20-21)

Conclusion

15. Claims 1-25 are REJECTED.

16. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. US Pat. Pub. 2006/0024413 A1 (Preparation of Pumpable, Edible Composition Using Electrodialysis); US 4,608,140 (Electrodialysis Apparatus and Process).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to COLLEEN M. RAPHAEL whose telephone number is (571)270-5991. The examiner can normally be reached on Monday-Friday, 9:30 a.m. to 6:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Keith D. Hendricks can be reached at (571)272-1401. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

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Examiner, Art Unit 1724
April 1, 2011

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